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Ramiphialis ronuroensis gen. and sp. nov., a hyphomycete from the Amazonian rainforest

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Abstract—A new asexual ascomycete genus and species, *Ramiphialis ronuroensis*, was discovered on decaying leaves from Amazon rainforest in Brazil and is described and illustrated here. Morphologically, the fungus is distinguished by macronematous, monophialidic and multibranched, discrete, and terminal and intercalary conidiogenous cells that produce filiform to falcate, unicellular, hyaline conidia.

Key words—biodiversity, taxonomy, tropical fungi

Introduction

The discovery of new species is important to improve understanding of which and how many species will extinct (Costello & al. 2013). Although the Amazon occupies a prominent position in relation to global biodiversity, many species are disappearing due to the human actions. Studies on asexual fungi from Brazil have received more attention in Atlantic forest and Caatinga biomes (Barbosa & al. 2013, Fiuza & al. 2015, Santa-Izabel & Gusmão 2018). According to Sotão & al. (2004), little is known about asexual fungi in

Amazon. The northern region of the Amazon has more studies (Carmo & al. 2014, Castro & al. 2012, Hernandez-Gutierrez 2013, Monteiro & al. 2014) while in the southern region the investigations are still initial (Barbosa & al. 2015, 2017).

A survey of asexual ascomycetes on plant debris was carried out in the southern Amazon forest and an interesting fungus with branched conidiophores and phialidic conidiogenous cells is proposed here as a new genus and species.

Materials & methods

Samples of plant debris were collected in November 2016 at Rio Ronuro Ecological Station, Nova Ubiratã, Mato Grosso state (9°52′24″S 58°13′17″W) and placed in paper bags. In the laboratory, samples were washed and stored in moist chambers following Castañeda-Ruiz & al. (2016). After 72 h, the reproductive structures were mounted in PVL resin (polyvinyl alcohol, lactic acid, and phenol) and examined and photographed using a microscope equipped with phase contrast. Drawing was produced according Almeida & Gusmão (2015). The type specimen was deposited in the Herbario Centro-Norte Mato-Grossense, Sinop, Mato Grosso State, Brazil (CNMT).

Taxonomy

Ramiphialis F.R. Barbosa, Fiuza & R.F. Castañeda, **gen. nov.**

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Differs from *Atrosetaphiale* by its branched conidiophores, terminal phialides, and falcate conidia; from *Veramycina* by the absence of setae; and from *Jayarambhatia* by its conidiophores with extensions, discrete phialides, and falcate conidia.

Type Species: *Ramiphialis ronuroensis* F.R. Barbosa & al.

Etymology: Latin, *rami*, referring to the branched conidiophores; and *phialidis*, referring to the type of conidiogenous cells.

Colonies scattered, dark brown. Mycelium superficial and immersed, composed of slightly branched, septate, smooth, brown hyphae. Conidiophores macronematous, mononematous, erect, straight or flexuous, branched, septate, with percurrent extensions, smooth, brown. Conidiogenous cells monophialidic, terminal and intercalary, discrete, determinate, pale brown. Conidial secession schizolytic. Conidia falcate, unicellular, hyaline accumulating in a white mucilaginous mass.

Ramiphialis ronuroensis F.R. Barbosa, Fiuza & R.F. Castañeda, **sp. nov.** Figs 1, 2

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Differs from *Atrosetaphiale flagelliformis* by its branched conidiophores, terminal phialides, and falcate conidia; from *Veramycina elegans* by the absence of setae; and from

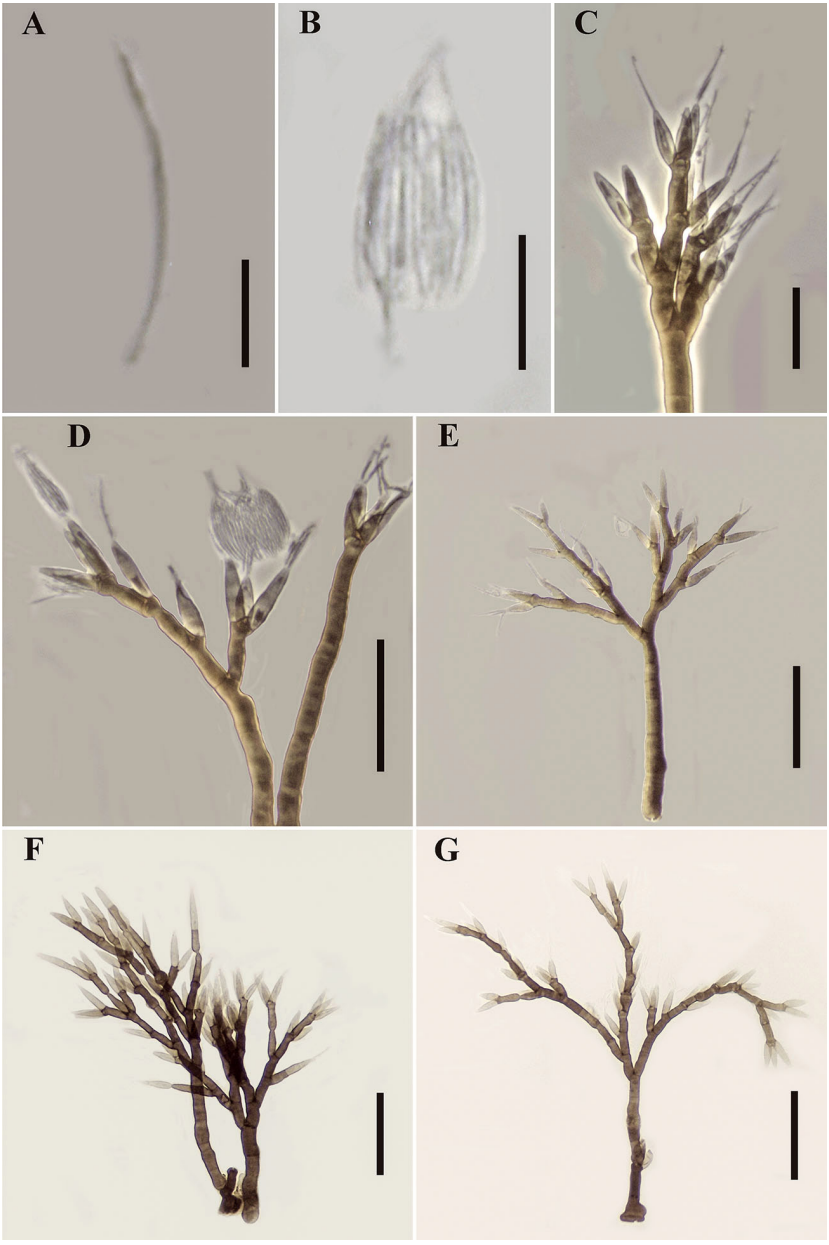

Fig. 1. *Ramiphialis ronuroensis* (holotype, CNMTf 80). A. Conidium; B. Conidia in mucilaginous mass; C, D. Conidiogenous cells and conidia; E–G. Conidiophores. Scale bars: A = 5 µm; B = 10 µm; C, D = 20 µm; E = 40 µm; F, G = 50 µm.

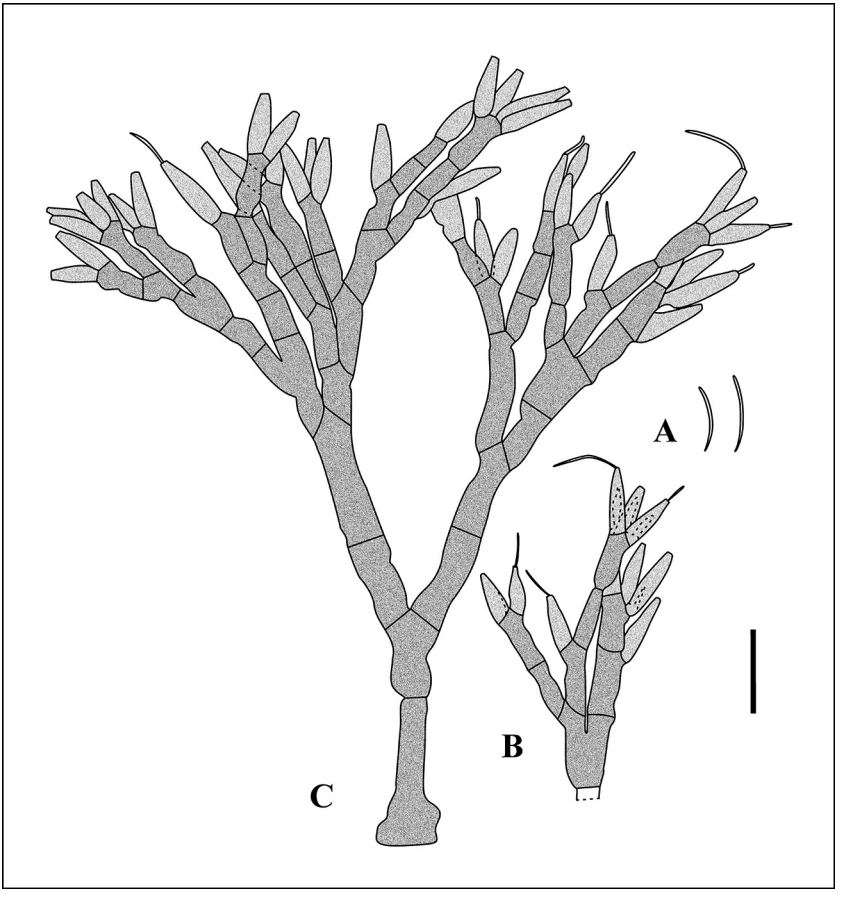

Fig. 2. *Ramiphialis ronuroensis* (holotype, CNMTf 80).
A. Conidia; B. Conidiophore, conidiogenous cells, and conidia; C. Conidiophore.
Scale bar = 20 μm.

Jayarambhatia rhizophorae by its conidiophores with extensions, discrete phialides, and falcate conidia.

Type: Brazil, Mato Grosso State, Nova Ubiratã, Estação Ecológica Rio Ronuro, on decaying leaves, 11.XX.2016, coll. F.R. Barbosa (**Holotype**, CNMTf 80).

Etymology: Latin, *ronuroensis*, refers to the place where the species was collected.

Colonies scattered, dark brown. Mycelium superficial and immersed, composed of slightly branched, septate, smooth, brown hyphae. Conidiophores macronematous, mononematous, erect, straight or flexuous,

multibranched, 5–12 septate, with percurrent extensions, smooth, brown, 130–200 × 6–9 µm. The branches are dichotomous starting near the lobed basal cell. Conidiogenous cells monophialidic, terminal and intercalary, discrete, sometimes forming subpenicillate clusters, evident, determinate, pale brown, cylindrical to slightly ovoid, 12.5–17.5 × 5 µm. Conidial secession schizolytic. Conidia filiform, falcate, hyaline, unicellular, smooth, 10–18(–25) × 0.5–0.7 µm, accumulating in a white mucilaginous mass.

Comments—*Atrosetaphiale* Matsush., *Jayarambhatia* J. Pratibha, and *Veramycina* Subram. superficially resemble *Ramiphialis* in possessing phialidic conidiogenous cells that produce narrow conidia. *Atrosetaphiale,* however, is distinguished by its unbranched conidiophores and lateral and terminal phialides; its type species, *A. flagelliformis* Matsush., produces cylindrical-fusiform to flagellate conidia (Matsushima 1995), in contrast to the filiform conidia characterizing *R. ronuroensis*. *Jayarambhatia* differs in its determinate conidiophores, integrated phialides with elongated narrow necks, and narrowly obclavate conidia, while the generic type, *J. rhizophorae* J. Pratibha, produces much larger conidia (30–50 × 1 µm; Pratibha 2013). *Veramycina,* the synanamorph of *Oedemium* Link, is distinguished by the production of setae, conidiophores bearing terminal short branches, terminal and lateral phialides, and cylindrical to bacillar conidia; the generic type, *V. elegans* Subram., produces much shorter conidia (1.5–3 µm; Subramanian 1993). However, *Ramiphialis* does not produce setae and has dichotomously branched conidiophores.

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Literature cited

Almeida DAC de, Gusmão LFP. 2015. Modification to the Barber and Keane's method of illustrating fungi. Mycosphere 6(5): 630–633. https://doi.org/10.5943/mycosphere/6/5/12

Barbosa FR, Raja HA, Shearer CA, Gusmão LFP. 2013. Some freshwater fungi from the Brazilian semi-arid region, including two new species of hyphomycetes. Cryptogamie Mycologie 34(3): 243–258. https://doi.org/10.7872/crym.v34.iss2.2013.243

Barbosa FR, Machiner M, Barbosa GCK, Alexandre FS, Ribeiro ML. 2015. Fungos conidiais decompositores de substratos vegetais. 41–52, in: DJ Rodrigues, JC Noronha, VF Vindica, FR Barbosa (eds.). Biodiversidade do Parque Estadual Cristalino. Áttema Editorial, São Paulo.

Barbosa FR, Gusmão LFP, Castañeda-Ruiz RF. 2017. *Craspedodidymella*, a new genus of hyphomycetes from the Brazilian Amazon rainforest. Mycotaxon 132 (3): 643–647. https://doi.org/10.5248/132.643

Carmo LT do, Monteiro JS, Gusmão LFP, Sotão HMP, Hernández-Gutiérrez A, Castañeda-Ruiz RF. 2014. *Anabahusakala*, a new genus from the Brazilian Amazon rainforest. Mycotaxon 127: 11–15. https://doi.org/10.5248/127.11

Castañeda-Ruiz RF, Heredia G, Gusmão LFP, Li DW. 2016. Fungal diversity of Central and South America. 197–217, in: DW Li (ed.). Biology of Microfungi. Springer, Switzerland. https://doi.org/10.1007/978-3-319-29137-6_9

Castro CCC, Hernández-Gutiérrez A, Sotão HMP. 2012. Fungos conidiais em *Euterpe oleracea* Mart. (açaizeiro) na Ilha do Combu, Pará-Brasil. Acta Botanica Brasilica 26(4): 761–771. https://doi.org/10.1590/S0102-33062012000400005

Costello MJ, May RM, Stork NE. 2013. Can we name Earth´s species before they go extinct? Science 339: 413–416.

Fiuza PO, Gusmão LFP, Castañeda-Ruiz RF. 2015. Conidial fungi from the semiarid Caatinga biome of Brazil: a new species of *Selenosporella* from submerged leaves. Mycotaxon 130: 601–605. https://doi.org/10.5248/130.601

Hernández-Gutiérrez A. 2013. New or rare fungi from eastern Amazonia. 1. *Circinoconiopsis amazonica* gen. and sp. nov. Mycotaxon 123: 107–111. https://doi.org/10.5248/123.107

Matsushima T. 1995. Matsushima mycological memoirs 8. Published by the author, Kobe.

Monteiro JS, Gusmão LFP, Castañeda-Ruiz RF. 2014. Two new microfungi from Brazilian Amazon Forest: *Atrogeniculata submersa* and *Nigrolentilocus amazonicus*. Mycotaxon 127: 39–45. https://doi.org/10.5248/127.39

Pratibha J. 2013. *Jayarambhatia rhizophorae* gen. et sp. nov., an asexually reproducing fungus from Goa, India. Mycotaxon 125: 139–144. https://doi.org/10.5248/125.139

Santa-Izabel TS, Gusmão LFP. 2018. Richness and diversity of conidial fungi associated with plant debris in three enclaves of Atlantic Forest in the Caatinga biome of Brazil. Plant Ecology and Evolution 151 (1): 35–47. https://doi.org/10.5091/plecevo.2018.1332

Sotão HMP, Campos EL, Costa SPS. 2004. Micologia; diversidade de fungos na Amazônia. Série cadernos de alfabetização científica. Vol. 1. 27 p.

Subramanian CV. 1993. *Veramyces,* a new hyphomycete genus from Kumaon Himalayas. Czech Mycology 47(1): 3–5. https://doi.org/10.33585/cmy.47102